



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,672	09/30/2004	David Shiung	13021-US-PA	5671

31561 7590 12/26/2007
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

CAMARGO, MARLY S.B.

ART UNIT	PAPER NUMBER
----------	--------------

4157

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

12/26/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USA@JCIPGROUP.COM.TW

Office Action Summary	Application No. 10/711,672	Applicant(s) SHIUNG ET AL.	
	Examiner MARLY CAMARGO	Art Unit 4157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/09/2007</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities:

In the specification:

Paragraph [0037], applicant discusses a matrix/array $M \times N$, where M represents the rows and N the columns. Generally, a matrix is represented as $M \times N$ or , but M represents the columns, which are referred first and N represents the lines/rows and is referred later.

Paragraphs [0038, 0039, 0042, 0043] discusses about the flow charts used to perform the image cell sampling of the sensor array from Fig 2B. However, there is no mention of a flow chart to do the reading/sampling of the sensor cells as disclosed in Figure 2C. Clarification is necessary.

It is incumbent for the applicant to verify the rest of the disclosure for similar corrections.

Drawings Objection

Objection to drawings, potential problems (***note***: *drawing objections must be corrected in the next response by applicant, it cannot be deferred, i.e., held in abeyance, or the application will be held ABANDONED*)

The drawings are objected to under 37 CFR 1.83(a) because they fail to show in Figure 3, step S411; Figure 4A, step S511 and Figure 4B, step S511 the proper way to read the next row in a matrix as described in the specification.

Art Unit: 4157

Following the steps shown in all these flow charts, it is not possible to read the pixel matrix. See paragraph [0039] for Fig. 3 and paragraph [0042] for Figs 4A and 4B. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 9 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claims 9 and 18:

The specification fails to lend adequate support to enable one to make and/or use an image sensor with pixel group arranged in a radial configuration. For example:

- (1) how each color filter is being configured on top of each sensor?
- (2) how scanning is performed?
- (3) what is the benefit of such an image sensor?
- (5) last but not least, how an image sensor as claimed can really reproduce an image captured from an object?

For the purpose of the prior art consideration, examiner will take the position that the cells in a “radially arranged image cell group” are actually arranged in rows or columns placed over a circular area.

Art Unit: 4157

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 9 and 18:

The language in claim 18 is unclear. How applicant makes this sort of circular image sensor area with pixels placed radially and how can it be used in an apparatus in order to take a picture? When pixels are placed radially, it means that there will be many blank spaces left in the image sensor area. In this way, it will not produce good pictures.

For the purpose of examination, the examiner has interpreted the image sensor area (claim 18) as a circular area composed with square or rectangular pixels, which would fill up the sensor area. This would make possible for the pixels to be readout in rows, columns, etc. In this case, a sensor thus construed would be effective to be used in apparatus in order to capture an image.

In claim 9, language is vague and indefinite, since it fails to particularly point out clearly what the method to read the pixels as disclosed in claim 18 is all about. How the reading of such pixels is done in an effective manner? What are the steps in the method to do that?

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8, 10 – 14, and 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Hiroshi Daiku et al. US PG Pub. 2004/0017493 A1 (filing date 07/07/2003), hereinafter, “Daiku”.

Regarding claim 10, which recites:

A apparatus for sensing an image, the apparatus comprising a plurality of image sensor cells being divided and grouped into a plurality of image cell groups, each of the image cell groups comprising a portion of said image sensor cells, wherein an image sampling process is performed on all of the image cell

Art Unit: 4157

groups as sampling units and image signals are sampled and generated therefrom.

(This claim is anticipated by Daiku for the following reasons. In paragraph [0004], Daiku teaches a color image sensor composed by a pixel array (Fig. 1), comprising a plurality of image sensor cells or pixels arrayed in a two-dimensional manner [0004] in groups composed of four pixels, with one red (R) pixel, two green (G) and one blue (B), which are repeated throughout the array in the Bayer pattern. The position of each pixel in the array or pixel matrix is expressed by coordinates. Then, for instance, in the first row and first column, the red pixel R_{1,1} is located; in the fourth row and third column, green pixel G_{3,4} is located and so on and so forth. Therefore, the group of 4 pixels can be considered as the sampling unit. The readout is performed on all the image cells and the analog image signal generated by the each pixel is converted into digital by an analog-digital (A/D) converter and outputted to a processing circuit. In Figure 7A, Daiku also shows a digital signal processing unit and a CPU that would do the image sensor cells sampling process.)

Regarding claim 11:

The apparatus as claimed in claim 10, wherein the image sampling process performed on the image cell groups is determined by an image processing specification thereafter.

Art Unit: 4157

(This claim is rejected in view of the same rationale used in claim 10. It is inherent in cameras/CMOS sensors technology to have image processing and associated system control (CPU) for determining how the sampling process is performed.)

Regarding claim 12:

The apparatus as claimed in claim 10, wherein a number of the image sensor cells in each of the image cell groups is the same.

(This claim is rejected in view of the same rationale used in claim 10. Daiku, [0004], teaches a sampling unit of 4 pixels that is repeated throughout the pixel array of Figure 1. Therefore, it will keep the same number of pixels per pixel unit.)

Regarding claim 13:

The apparatus as claimed in claim 10, wherein a number of the image sensor cells in each of the image cell groups is different from each other.

(This claim is rejected in view of the same rationale used in claim 10. In the expressions written below the pixel array of Figure 8, Daiku teaches this limitation for the green pixel units G1 and G2. G1 is composed by adding pixels such as $(1 \times G_{2,1} + 1 \times G_{1,2} + 1 \times G_{3,2} + 1 \times G_{2,3})/4$. For the green pixel unit G2 he adds a different amount of green pixels, as $(1 \times G_{1,1} + 1 \times G_{6,1} + 4 \times G_{5,2} + 1 \times G_{4,3} + 1 \times G_{6,3})$. One skilled in the art would interpret it as having pixel units

Art Unit: 4157

with different number of pixels (or sensor cells), since in G1 one has the total of one pixel for the green pixel unit and for the green unit G2, one has the total of 7 pixels.)

Regarding claim 14:

The apparatus as claimed in claim 10, wherein all of the image sensor cells are arranged in an array order, called image cell array.

(This claim is rejected in view of the same rationale used in claim 10. In Fig 1 and paragraph [0004], Daiku teaches a pixel array, where the pixels are image cells and therefore, for the one skilled in the art, they form a so called image cell array.)

Regarding claim 19:

The apparatus as claimed in claim 10, wherein each of the image sensor cells comprising a plurality of color sensor units, the color sensor units being used to sense red, green and blue lights, respectively.

(This claim is rejected in view of the same rationale used in claim 10. As discussed in the aforementioned rejection, Daiku teaches in [0004] a color image sensor composed by a pixel array (Fig. 1), comprising a plurality of image sensor cells or pixels arrayed in a two-dimensional manner [0004] in groups composed by four pixels, with one red (R) pixel , two green (G) and one blue (B) or in the Bayer pattern. This 4-pixel unit is repeated throughout the pixel array.)

Art Unit: 4157

Regarding claim 20:

The apparatus as claimed in claim 10, wherein each of the image sensor cells comprises a color sensor unit, the color sensor unit being used to sense one of the red, green and blue lights, respectively.

(This claim is rejected in view of the same rationale used in claims 10 and 18, since Daiku, [0004], teaches a pixels array (Fig. 1) composed by a plurality of color sensors, with the smallest unit comprising 4 pixels, one red (R), two green (G) and one blue (B), which would sense the light wavelengths corresponding to each filter. Therefore, the “blue sensor” has a blue filter, which would permit only blue light component to pass through it and to be absorbed by the photodiode. The same rationale is applied to the other color filters.)

Regarding claims 1-8, which pertains to a method comprising steps corresponding to elements of apparatus claims 10-20. Thus, claims 1-8 are rejected as applied to claims 10-20 because operating the apparatus of claims 10-20 would have inherently necessitated performing the method steps as recited in claims 1-8.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the

Art Unit: 4157

differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in **Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966)**, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: (***See MPEP Ch. 2141***)

- a. Determining the scope and contents of the prior art;
- b. Ascertaining the differences between the prior art and the claims in issue;
- c. Resolving the level of ordinary skill in the pertinent art; and
- d. Evaluating evidence of secondary considerations for indicating obviousness or nonobviousness.
- e.

Claims 9 and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over “Hiroshi Daiku et al. US PG Pub. 2004/0017493 A1 (filing date 07/07/2003)” in view of “E. Gordon, US 5,061,036 (10/10/1991)”.

Regarding claim 18:

The apparatus as claimed in claim 14, wherein the image sensor cells in each of the image cell groups are arranged in a plurality of rows in a radial order in the image cell array.

(This claim is rejected in view of the same rationale used in claims 14 and 10. Although Daiku, Figures 1 and 7, teach an image apparatus with the image cells (pixels) arranged in a plurality of rows (Fig. 1), he fails to teach the image cells arranged in a radial order, which would imply in the image sensor area being circular.

Art Unit: 4157

On the other hand, in Figure 4, Gordon teaches an apparatus where the image sensor is used against the surface of a fiber bundle with a circular cross section. Although the image cells are placed in a circular area, the color cells are squares, which would be read [column 3, lines 59 – 62] either in a “time sequential” color in which all red, then all green, and finally all the blue pixels are read out in sequence. Another way would be to read red, green, and blue for each pixel in sequence.

It would have been obvious to the one with ordinary skills, at the time of the invention, to combine both references, since Daiku teaches an image apparatus with a plurality of pixels arranged in a plurality of rows and columns and Gordon teaches a circular pixel area which has the advantage of permitting the color scanner operation of an image to be achieved with a monochrome photosensor array in the absence of time-sequential color illumination.)

Regarding claim 9:

The method as claimed in claim 5, wherein the image sensor cells in each of the image cell groups are arranged in a plurality of rows in a radial order in the image cell array.

(This claim is rejected in view of the same rationale used in claims 5 and 1. Besides, this claim is just a method step to read the image cells of the image sensor area as disclosed in claim 18 and therefore, for the same rationale used in claim 18, it is also rejected.)

Art Unit: 4157

Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over “Hiroshi Daiku et al. US PG Pub. 2004/0017493 A1 (filing date 07/07/2003)”, hereinafter, “Daiku”.

Regarding claims 15-17:

Daiku is silent on a particular read-out pattern of row-by-row, column-by-column, or zig-zag pattern as recited in claims 15-17 respectively. However, Official Notice is taken to note that the concept and benefit of utilizing one of said read-out patterns are notoriously well known and practiced in the art when it comes to considerations such as chip size design, power consumption, and costs, to name a few. Therefore, pixel sampling via one of said read-out patterns as claimed would have been obvious as alternatives based on some of the considerations mentioned above. Furthermore, image sensors such as CCD or CMOS have the implied capability to sequentially readout pixels from the image sensor area in either row-by-row, column-by-column, zig-zag, or any of the combinations as dictated by design considerations.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marly Camargo whose telephone number is (571) 270-3729. The examiner can normally be reached on 6:00AM - 10PM, M-F, EST.

Art Unit: 4157

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vu Le can be reached on (571) 272-7332. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Marly Camargo/
Patent Examiner
AU4157 DKS 3015
Phone: (571) 270-3729
e-mail: marly.camargo@uspto.gov

/Vu Le/
Supervisory Patent Examiner, Art Unit 4157
Patent Training Academy